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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,348	08/29/2003	Franklin J. Wall JR.	LUM-03-06-10	1306

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PATENT LAW GROUP LLP
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EXAMINER

FARAHANI, DANA

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,348

Applicant(s)

WALL, FRANKLIN J.

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 3 and 9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. Specifically, claim 3, broadens the scope of claim 1 by adding the other materials, stated in claim 3, to the core layer of claim 1 being only ceramic; and claim 9 broadens the lower boundary of the thickness of the at least copper layer from “at least 4 mils” to “about 4 mils”.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-17 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is unclear as to how many copper layers are required by claim 1: compare “at least one copper layer” (singular) to “at least one of the copper layers” (plural).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-9, 16, 17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama (US Patent 4,012,833), previously cited.

Regarding claims 1, 3, 7, 9, 16, 17, and 23, Akiyama discloses in figures 4A-4B, a structure comprising a semiconductor light emitting device (not shown); and a substrate 33 and 34 comprising a ceramic core 34 and at least one copper layer 32 overlying and in contact with the core (note that the presence of the iron layer 37 between the copper layer and the core layer does not exclude the copper layer being in contact with the core layer. See claim 8 of the present claimed invention evidencing Applicant is using "in contact with" to include "in indirect contact with"); wherein the semiconductor light emitting device is electrically connected to at least one of the copper layers. Although, Akiyama does not expressly disclose the copper layer thickness (e.g. claim 1) and the thermal conductivity of the substrate (e.g. claim 23), it would have been obvious to one of ordinary skill in the art at the time of the invention to make the adjustments regarding the thickness of the layer and the thermal conductivity of the substrate, in order to accommodate larger LED devices on the substrate and radiate heat from such devices in a desired rate in accordance with the environment in which the LED package is used. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) for the proposition that discovering an optimum value of a result effective variable involves only routine skill in the art.

Regarding claim 2, Akiyama discloses the limitation in the claim, but does not disclose the light-emitting element 12 has a III-nitride light-emitting layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a III-nitride type light

emitter layer, in order to emit any color of desired light (i.e. UV-red) or combinations thereof (e.g. white). Figure 1 of the instant application provides further evidence that it is conventional to flip-chip mount a group III-nitride LED.

Regarding claims 4 and 5, at least one lead 35 is connected to the copper layer.

Regarding claim 6, a terminated wire 22 is connected to the copper layer 2 (figure 3D).

Regarding claim 8, the copper layer is bonded to the core layer by the metal braze 31.

6. Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama as applied to claim 1 above, and further in view of Raj et al., hereinafter Raj (US Patent Application Publication 2002/0175339), previously cited.

Regarding claim 10, Akiyama substantially discloses the limitations in the claim, as discussed above, except for a second substrate layer between the copper substrate and the light emitting device.

Raj discloses a transceiver in figure 4; wherein light emitting devices 110 are mounted on a substrate 106. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use another substrate along with the corresponding light emitting devices on that substrate on the copper substrate of the Akiyama's structure in order to utilize the structure in applications such as fiber optics, as Raj reference discloses.

Regarding claims 11 and 13, Raj discloses bond pads 402, and insulating layers (see paragraph 29).

Regarding claim 12, Akiyama in view of Raj substantially discloses the limitations in the claim, as discussed above, except for an AlN insulating layer. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an AlN insulator in

Art Unit: 2814

the optical fiber circuitry in the structure since it is known that this material has the same thermal efficiency as ceramic and therefore is suitable to use it with the light emitting device of Akiyama

Regarding claim 14, Raj further discloses a base connected to the substrate. (see claim 10).

Regarding claim 15, Raj discloses a lens 112 included with elements 110.

Product-by-Process Limitations

A comparison of the recited process with the prior art process does NOT serve to resolve the issue concerning patentability of the product. *In re Fessman*, 489 F2d 742, 180 USPQ 324 (CCPA 1974). Whether a product is patentable depends on whether it is known in the art or it is obvious, and is not governed by whether the process by which is made is patentable. *In re Klug*, 333 F2d 905, 142 USPQ 161 (CCPA 1964). In an ex parte case, product by process claims are not constructed as being limited to the product formed by the specific process recited. *In re Hirao et al.*, 535 F2d 67, 190 USPQ 15, see footnote 3 (CCPA 1976). Therefore, in claims 7 and 17, the process of bonding (or in case of claim 7, the method which is used in bonding) the copper layer to the core is given no patentable weight.

Response to Arguments

7. Applicants' arguments filed on 11/23/04 have been fully considered but they are not persuasive.

Regarding applicants' argument that the limitation in claim 1, namely a ceramic core and one copper layer overlying and in contact with the core is not disclosed in the Akiyama reference, as discussed in the above rejections the reference discloses this limitation.

Regarding applicants' argument that it would not have been obvious to modify the thickness of the copper layer, as mentioned in the above rejection, it would have been obvious to modify the thickness to make the display device suitable for various LED sizes, specifically larger LEDs. See *In re Rose*, 105 USPQ 237 (CCPA 1955) for the proposition that a change in size of a component is within the level of ordinary skill in the art.

Applicants argue that claims 10-15 are allowable over the prior art, since they add nothing to the deficiencies of the Akiyama reference, with respect to claim 1. However, as noted above, the reference renders obvious the claimed subject matter.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

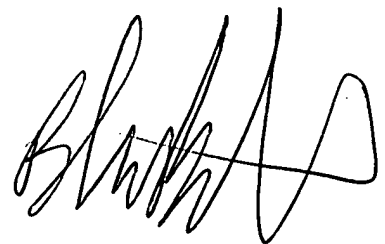
however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Farahani

A handwritten signature in black ink, appearing to read 'Bradley Baumeister', with a stylized, flowing script.

**BRADLEY BAUMEISTER
PRIMARY EXAMINER**